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Demographic differences in drug dependency: implications for policy, practice, and research

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DEMOGRAPHIC DIFFERENCES IN DRUG DEPENDENCY: IMPLICATIONS FOR POLICY, PRACTICE, AND RESEARCH

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ABSTRACT

The purpose of this research study was to examine whether there are differences in drug dependency based on demographic characteristics. The four most commonly used or abused drugs were included in this analysis (i.e., nicotine, alcohol, pain relievers, and marijuana). The secondary purpose is to explore whether there were demographic differences in mental health and drug treatment among those with a substance use disorder. Substance dependence is a state in which someone can only function normally with the presence of a drug. Past research has examined this topic to some degree; however, trends often change over time. This study found some significant results in nicotine, alcohol, pain reliever, and marijuana dependence, as well as in treatment. Implications for research, practice, and policy will be discussed.

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Literature Review

Introduction

Substance use is the continued use of alcohol, illegal drugs, or the misuse of drugs that are legal or that can purchased over the counter of a drug store (Martin, 2016). Although the Diagnostic and Statistical Manual of Mental Disorders V (DSM-V) no longer uses the terms “substance abuse” or “substance dependence”, this study will focus on data that was collected during the transition to the DSM-V and focus on dependence. For contextual purposes, the DSM-V currently refers to the terms substance abuse or substance dependence as a “substance use disorder.” Substance use disorders happen when there is a consistent use of any type of conscious-altering drug that causes significant impairment to the point of developing health problems, disability, and/or failure to live a functional life (Harrington, 2015). Substance dependence is a state in which someone can only function normally with the presence of a drug (NIDA, 2007). It has been found that 23.5 million Americans are addicted to alcohol and drugs (Join Together Staff, 2010).

As a social worker, understanding drug use is important because it relates to advancing human rights and social and economic justice, as drug use is related to many social problems (e.g., public health or safety, abuse and/or addiction, family dysfunction, job loss, academic problems, intimate partner violence, child abuse, etc.; National Institute of Drug Abuse, 2012). Drug use can also have a negative effect on society. Estimates of the total cost of substance abuse in the United States exceed $600 billion annually, which includes approximately $193 billion for illicit drugs (National Drug Intelligence Center, 2011). Understanding factors that contribute to drug use can help

social workers advocate and fight for social and economic justice for both those struggling with drug use and those associated with the user.

Commonly Abused Substances and Impact of Drug Use

The most commonly abused drug is alcohol, followed by marijuana, and pain relievers (Green, 2014). There has been some fluctuation on where nicotine stands in those numbers, but more recent research says that it is second to alcohol (Sontineni, Chaudhary, Sontineni, & Lanspa, 2009). Nicotine is in usually anything like a cigar, cigarette, or pipe tobacco. There are products such as snuff or chewing tobacco that are considered smokeless tobacco (NIDA, 2017). Alcohol is any beverage that has ethyl or ethanol in it (Responsible Drinking, 2016). Marijuana is anything that comes from the plant cannabis, and is usually smoked (NIDA, 2017). Pain relievers are usually legal drugs, and typically come in the form of pills (U.S. National Library of Medicine, 2017). They are used as over the table drugs that are made to relieve physical pain, however, they can be abused as much as an illegal drug.

Nicotine is an ingredient in any type of tobacco product, and it is very addictive (NIDA, 2017). Using tobacco products with nicotine in them can lead to lung cancer, chronic bronchitis, and emphysema (NIDA, 2017). It also increases the risk of heart disease, which can lead to stroke or heart attack (NIDA, 2017). Smoking has also been linked to many cancers, leukemia, cataracts, and pneumonia (NIDA, 2017). Smokeless tobacco, which also nicotine in it, particularly increases the risk of mouth cancers (NIDA, 2017). These health effects are not only a problem to the one who smokes, but smoking also causes low birth weight, increased chance of miscarriage, and the effects of

secondhand smoke can also lead to many of the same health problems as firsthand smoking (NIDA, 2017).

Alcohol interferes with the brain's communication pathways, which can change mood and behavior, make it more difficult to think clearly, and affect movement coordination (NIAAA, 2015). Repeated alcohol abuse can damage the heart, cause liver inflammation, cause the pancreas to produce toxic substances that can eventually lead to pancreatitis, cause different types of cancers, and weaken the immune system (NIAAA, 2015). Not only is alcohol abuse dangerous for the user, but it also increases the risk of drunk driving accidents. In 2014, a total of 9,967 people were killed in alcohol-impaired driving crashes, accounting for nearly one-third (31%) of all traffic-related deaths in the United States (Department of Transportation, 2015).

A person may encounter negative short term effects on the brain such as attention, memory, and learning problems if they heavily use marijuana. More long term affects include reduced attention span, memory, and learning functions due to marijuana interfering with how the brain builds connections between these areas (Filbey et al., 2014; Goldschmidt, Day, and Richardson 2000; Meier, et al., 2012). Not much research has been done to explore whether or not marijuana causes cancer, however, there is an association between smoking marijuana and testicular cancer (Gurney, Shaw, Stanley, Signal, & Sarfati, 2015). Marijuana has also been shown to cause high heart rate and blood pressure (Sidney, 2002). These effects alone are harmful to individuals, but they may be worsened due to the controversial nature of the legalization of marijuana in contemporary society.

One of the biggest problems with pain relievers is that they are very addictive (Cleveland Clinic, 2013). From the year 2003 to the year 2013, the number of deaths from painkillers, including opioids, has quadrupled to nearly 15,000 per year in the United States (Cleveland Clinic, 2013). Other side effects from consistent use of pain relievers include constipation, hormone imbalance, worsened pain, weakened immune system, and depression (Cleveland Clinic, 2013). The effects of pain relievers, along with the addictive nature of them, make it a long-term problem for society due to them being available relatively easily.

Legality and Access to Substances

Whether a drug is legal or illegal can depend on what country or state that the user is in. However, under the Controlled Substances Act, unlawful or illegal use of drugs means having drugs in your possession, selling or giving drugs to someone else, or using drugs yourself (42 U.S. Code § 12210). Such term does not include the use of a drug as prescribed from a medical professional (42 U.S. Code § 12210). Despite the policy regarding legal and illegal usage of drugs, it is possible for many legal substances to be used in a harmful or illegal manner. Nicotine is legally available for purchase and for use by those 18 and up (Tobacco Control Legal Consortium, 2009). Alcohol is legally available for purchase and consumption in the United States at the age of 21 (Department of the Treasury Alcohol and Tobacco Tax and Trade Bureau, 2007). Marijuana is available for medical usage in the United States in 28 states plus the District of Columbia (ProCon, 2017). There are eight states and the District of Columbia, in which marijuana is available for recreational use. They include Alaska, California, Colorado, Maine, Massachusetts, Nevada, Oregon, and Washington (Drug Policy Alliance, 2016). Certain

pain relievers, such as Paracetamol, Ibuprofen, Aspirin, and even stronger pain relievers such as Codeine and Morphine can be purchased at a pharmacy (Health Direct, 2016). Other more strong pain relievers have to be prescribed from a physician. There is no limit for how long a physician can prescribe certain pain relievers, however, there are limits on how often they can fill the prescription (Heit & Gilson, 2010). Regulations are not as strict in regard to the use and purchase of pain relievers; however, the Centers for Disease Control (2016) has recently developed guidelines and recommendations for the use and prescription of pain relievers to ensure that they do not get abused.

Risk and Protective Factors for Drug Use

There has been extensive research aimed at understanding drug use, risk factors, and predictors for drug use. Individual risk factors for drug use include exposure to alcohol prenatally or genetic factors that predispose them toward alcohol (SAMHSA, 2015). An example of other genetic factors would be someone getting sick from lower doses of drugs as opposed to higher doses of drugs, naturally having a higher tolerance to alcohol, and the lowering or not lowering of anxiety levels when consuming alcohol (Goode, 2012). It has even been shown that the preference of alcoholic beverages over non-alcoholic beverages can be bred into animals (Goode, 2012). Another area in which someone can develop risk factors for drug use is in their relationships, specifically if their parents have used drugs and alcohol or suffer from a mental illness, child abuse or maltreatment, and inadequate supervision (SAMHSA, 2015). Community risk factors may also be relevant, specifically if an individual resides in a neighborhood that is violent and impoverished (SAMHSA, 2015). Lastly, society may also pose risk factors, such as developing norms or laws that are more favorable toward substance abuse, permeating

racial stereotypes (e.g., the stereotype that African Americans use illegal drugs more than any other race), and lacking in the amount or development of economic opportunities an individual might have access to (SAMHSA, 2015).

While there are certain factors that put a person more at risk for abusing or becoming dependent drugs, there are also protective factors that prevent them from using drugs. Individual protective factors against drug use include having positive self-image, good self-control, and social competence (SAMHSA, 2015). Another area in which someone can develop protective factors for drug use is in their relationships, specifically how much parental involvement someone had in their life growing up and their engagement in more social behaviors (SAMHSA, 2015); (Herman-Stahl, Krebs, Kroutil, Heller, 2007). Community protective factors may also be relevant, specifically the availability of faith-based resources and after-school activities as a support system (SAMHSA, 2015). Lastly, society may also have protective factors, such as hate crime laws or policies limiting the availability of alcohol (SAMHSA, 2015).

Substance Use and Mental Health Treatment

Multiple barriers exist to accessing substance use or mental health treatment. Lack of insurance coverage, not being able to pay treatment expenses, time conflicts, or scheduling difficulty was commonly reported as external barriers to seeking substance abuse treatment (Appel, Ellison, Jansky, & Oldak, 2004; McCoy, Metsch, Chitwood, & Miles, 2001). Many drug users are unable to go to substance abuse treatment because of the inconvenience posed by time-consuming and complicated treatment intake procedures (Melnyk, 1990). The evidence suggests that a short waiting time is of considerable importance and long waiting times for treatment entry may impede service

linkage (Melnyk, 2006). An additional external barrier suggested by some authors is treatment accessibility, including transportation difficulties, distance to care, not knowing where to go, and lack of information about possible sources of help (Beardsley, Wish, Fitzelle, O'Grady, Arria, 2003; Grant, 1997; McCoy et al., 2001).

Past research about drug treatment indicates that many people do not receive any treatment (Urbanoski, 2007; 2008). In the National Survey of Drug Use and Health, 35% of individuals who showed evidence of a substance use disorder and of non-severe mental health symptoms reported receiving any treatment during the preceding year (Harris & Edlund. 2005). However, the same study found the number of those receiving treatment rose to 54% when the co-occurring condition could be classified as a serious mental illness. Harris and Edlund (2005) also found that individuals with co-occurring disorders who received either substance abuse or mental health treatment—but not both—were nearly three times as likely to receive either mental health or substance abuse treatment services only if they were without serious mental illness (i.e., 20.7% received mental health services only and 7.6% received substance abuse services only). That number increased to nine times as likely to receive mental health services, only if they evidenced serious mental illness (i.e., 34.4% received mental health services only and 4.1% received substance abuse services only; Flynn & Brown, 2008). The most common reasons for not receiving mental health treatment were (1) not being able to afford the cost of treatment, (2) A fear of being committed to a psychiatric hospital or being forced to take medications, (3) lack of knowledge about where to go to receive treatment, and (4) a feeling that the participant should be able to handle the problem on his or her own (Mojtabai, 2014). In the same study the most commonly reported reasons for not

receiving substance use disorder treatment in order of most reported to least were (1) not being able to afford the cost of treatment, (2) not wanting to stop the use of drugs or alcohol, (3) fears about stigmatizing attitudes of neighbors and community, and (4) lack of knowledge about where to go to receive treatment (Mojtabai, 2014).

Those without insurance coverage are significantly more likely than those with insurance coverage to report cost barriers to treatment (Mojtabai, 2014). Non-insured persons also report a lack of transportation, issues with the distance to a treatment facility, or inconvenience as a barrier to mental health treatment (Mojtabai, 2014). However, individuals without health insurance coverage were less likely than those with coverage to report lack of insurance coverage as a barrier to substance use disorder treatment than those who had health insurance (Mojtabai, 2014). This is surprising considering that the assumption would be that those without insurance would be more likely to report it as a barrier to getting treatment. Perhaps those without insurance coverage do not view it as being a problem, and therefore, don't report it as being a barrier to treatment.

Theoretical Perspective

There are many theories that help explain why people use drugs. Historically, most people thought that drug use was a result of demonology, which means the devil or some sort of evil spirit made them do it (Goode, 2012). More contemporary explanations for drug use center around biological, psychological, and sociological aspects of drug use. Biological theories originate from the idea that physical elements influence people to take or abuse drugs (Goode, 2012). An example would be that someone's genetic makeup predisposed them toward alcohol or drug abuse. Psychological theories propose that drug

use is reinforced or that it is tied to the individual drug user's personality (Goode, 2012). For example, the use of reinforcement may influence someone's use of drugs or alcohol. Reinforcement is when a person is rewarded for certain behaviors. In the context of drug use, this means they are positively rewarded for using drugs so they continue to use them. Sociological theories base their explanations for drug use by focusing on the situations, social relations, or social structures that the individual is in (Goode, 2012). An example would be any type of problem within the structure of society that predisposes someone toward drug use, such as inadequate resource distribution, large amounts of drug use and crime due to inadequate enforcement of laws, and laws that encourage drug use.

Anomie theory says that when a person fails to meet material success, through either legal or illegal means, they turn to drug use as a result drug use as the result. Society is highly competitive and success is only attainable for a small amount of society. The remaining people who do not obtain success must therefore find different ways of ways of dealing with their failure, which frequently involve deviant behavior. They become retreatists and turn to drugs as a way to deal with the failures that they have experienced in society (Goode, 2012). An example would be a person turning to drugs because they have been blocked off to material success, such as failing to succeed through legal or illegal means. To further explain, a person may try legal to means to obtain material success by going to college, obtaining a degree, and getting a well-paying job. If that fails, they may try and obtain material success through illegal means, such as selling drugs for money or stealing products that they can re-sell at a better price. When both of those means fail, they have been blocked off from material success, and turn to drugs as a result. Someone may turn to drugs when they have difficulty getting a job

because having a job is often related to economic well-being and personal or professional status.

Social disorganization theory states that the key to deviant behavior, such as drug use, is that members of the neighborhood or community are unwilling or unable to monitor or control wrongdoing, which leads to disorganization (Goode, 2012). This could apply to inadequate parenting, inadequate policing, and drug use. As a result of these factors, a person is likely to develop low self-control and could begin to abuse drugs, commit theft, and engage in violent behavior. Neighborhood social disorganization and low self-control are structural in nature versus an individual level explanation of the same basic factors (Goode, 2012). This theory could explain why those in lower income neighborhoods would be more likely to use drugs than those in higher income neighborhoods, as lower income individuals may have less resources for monitoring or controlling deviant behavior or drug use.

Conflict theory also supports the idea that drug use is strongly related to social class, income, power, and locale (Goode, 2012). Conflict theory has its roots in economics and politics. In more recent years, large economic and political developments have had an affect the amount of drug use. Since the 1970s, jobs that require manual labor and lower skilled or lower educated workers have been disappearing, and there has been an increase in jobs requiring a higher level of education (Goode, 2012). As a result, low-income individuals and families have turned to drug use (Goode, 2012). Both income and education are demographic variables that impact social class, and conflict theory explains that drug use as a common result of an imbalance of access to resources and power.

Purpose

The purpose of this research study was to examine whether there are differences in drug dependency based on demographic characteristics. The four most commonly used or abused drugs were included in this analysis (i.e., nicotine, alcohol, pain relievers, and marijuana). The secondary purpose is to explore whether there were demographic differences in mental health and drug treatment among those with a substance use disorder. The research questions that were addressed included: (1) Does drug dependency differ among those with differing socioeconomic status, gender, age, education, or race/ethnicity? (2) Is there a significant difference in who attends treatment (i.e., mental health treatment, drug treatment) based upon demographic characteristics (e.g., socioeconomic status, gender, age, education, or race/ethnicity)? Finally, this study will explore implications for research, social work practice, and policy.

Methods

Sample

The unit of analysis for this study included civilians with a dependency on nicotine, alcohol, pain relievers, or marijuana residing in the United States. Participants were age 18 or older. There was a total of $N = 8958$ participants. Specifically, this is was secondary data analysis utilizing data from the 2013 National Survey on Drug Use and Health (NSDUH). Participants were excluded from the study if they resided in institutionalized settings, such as college dormitories, group homes, shelters, rooming houses, and military installations. See Table 1 for more information.

Table 1. *Demographic characteristics of the sample*

Variable	Nicotine	Alcohol	Pain Relievers	Marijuana	Mental Health	Substance Abuse
Gender						
Male	4817 (53.8%)	4817 (53.8%)	4817 (53.8%)	4817 (53.8%)	4777 (53.7%)	319 (56.2%)
Female	4141 (46.2%)	4141 (46.2%)	4141 (46.2%)	4141 (46.2%)	4120 (46.3%)	249 (43.8%)
Age						
Young adult (18-30)	5504 (61.4%)	5504 (61.4%)	5504 (61.4%)	5504 (61.4%)	5459 (61.4%)	374 (65.8%)
Middle adult (31-64)	3245 (36.2%)	3245 (36.2%)	3245 (36.2%)	3245 (36.2%)	3230 (36.3%)	193 (34.0%)
Older adult (65+)	209 (2.3%)	209 (2.3%)	209 (2.3%)	209 (2.3%)	208 (2.3%)	1 (0.2%)
Race						
White	6032 (67.3%)	6032 (67.3%)	6032 (67.3%)	6032 (67.3%)	5995 (67.4%)	396 (69.7%)
Black	1049 (11.7%)	1049 (11.7%)	1049 (11.7%)	1049 (11.7%)	1040 (11.7%)	50 (8.8%)
Native Am/AK Native	206 (2.3%)	206 (2.3%)	206 (2.3%)	206 (2.3%)	204 (2.3%)	15 (2.6%)

Table 1 Continued

Variable	Nicotine	Alcohol	Pain Relievers	Marijuana	Mental Health	Substance Abuse
Race Cont'd						
Native HI/Pac Isl	49 (0.5%)	49 (0.5%)	49 (0.5%)	49 (0.5%)	48 (0.5%)	2 (0.4%)
Asian	194 (2.2%)	194 (2.2%)	194 (2.2%)	194 (2.2%)	193 (2.2%)	7 (1.2%)
More than one race	366 (4.1%)	366 (4.1%)	366 (4.1%)	366 (4.1%)	363 (4.1%)	23 (4.0%)
Hispanic	1062 (11.9%)	1062 (11.9%)	1062 (11.9%)	1062 (11.9%)	1054 (11.8%)	75 (13.2%)
Education						
Less than high school	1912 (21.3%)	1912 (21.3%)	1912 (21.3%)	1912 (21.3%)	1889 (21.2%)	153 (26.9%)
High school diploma	3167 (35.4%)	3167 (35.4%)	3167 (35.4%)	3167 (35.4%)	3143 (35.3%)	195 (34.3%)
Some college	2655 (29.6%)	2655 (29.6%)	2655 (29.6%)	2655 (29.6%)	2646 (29.7%)	161 (28.3%)
College graduate	1224 (13.7%)	1224 (13.7%)	1224 (13.7%)	1224 (13.7%)	1219 (13.7%)	59 (10.8%)
Income						
Less than $20,000	3016 (33.7%)	3016 (33.7%)	3016 (33.7%)	3016 (33.7%)	2989 (33.6%)	227 (40.0%)
$20,000 - $49,999	3046 (34.0%)	3046 (34.0%)	3046 (34.0%)	3046 (34.0%)	3025 (34.0%)	178 (31.3%)
$50,000 - $74,999	1208 (13.5%)	1208 (13.5%)	1208 (13.5%)	1208 (13.5%)	1202 (13.5%)	71 (12.5%)
$75,000 or more	1688 (18.8%)	1688 (18.8%)	1688 (18.8%)	1688 (18.8%)	1681 (18.9%)	92 (16.2%)

Data Collection and the 2013 National Survey on Drug Use and Health

Before limiting the analysis to adults age 18 and older, the entire sample size of the 2013 National Survey on Drug Use and Health (NSDUH) included 67,838 people (U.S. Department of Health and Human Services [USDHHS], 2013). The NSDUH is a large secondary data set intended to examine drug use, mental health, treatment, and

other factors related to substance use (USDHHS, 2013). A multistage area probability sample was used to collect data, and there is a 50% overlap from the previous year, which means that half the second stage units from the previous year were included in the sample. This was used to increase the accuracy of estimates because there was an expected positive correlation as a result from the overlapping sample between the successive survey years (USDHHS, 2013). The 2013 design allows for calculation of the estimates by each state in all 50 states plus the District of Columbia. States may therefore be viewed as the first level of stratification as well as a reporting variable. There are eight states, which are referred to as the large sample states. They had a sample designed to yield 3,600 respondents per state for the 2013 survey. This sample size was considered adequate to support direct state estimates. The remaining 43 states, which included the District of Columbia for this sample, had a sample designed to yield 900 respondents for each state in the 2013 survey. In these 43 states, adequate data were available to support reliable state estimates based on small area estimation (SAE) methodology (U. S. Department of Health and Human Services. 2013).

In each of the states, a form of stratified sampling was used. Based on a composite size measure, each state was geographically divided into roughly equal-sized regions. In other words, each region was broken up in such a way that it yielded roughly the same number of interviews during each data collection period. The eight large sample states were divided into 48 regions each. The remaining states were divided into 12 regions each. Therefore, the partitioning of the United States resulted in the formation of a total of 900 sampling regions (USDHHS, 2013). The first stage of selection started with the creation of an area sample frame that contained one record for each Census tract in

the United States. These Census tracts served as the primary sampling units (PSUs) for the overall sample that was collected over a five-year time. One area segment (one or more Census blocks) was selected within each sampled Census tract. Specially trained research staff visited each area segment and listed all addresses for housing units and eligible group residences in a prescribed order prior to the survey period (U. S. Department of Health and Human Services. 2013). Systematic sampling was used to select the final sample of addresses from each segment. All consent was gathered prior to the study and data was collected using audio computer-assisted self-interview (ACASI), computer-assisted personal interview (CAPI), and computer-assisted self-interview (CASI). Each respondent who completed a full interview was given a $30 cash payment as a token of appreciation for his or her time.

Measures

The following variables are the measures for the questions about drugs used for this research study:

Nicotine dependence. Nicotine dependence was represented through the use of the variable labeled "nicotine dependence in the past year", which was coded as DNICNSP in the original NSDUH codebook. This variable included the following categories: No (coded as 0) and Yes (coded as 1).

Alcohol dependence. Alcohol dependence was represented through the use of the variable labeled "alcohol dependence in the past year", which was coded as DEPNDALC in the NSDUH codebook. This variable included the following categories: No (coded as 0) and Yes (coded as 1).

Pain reliever dependence. Pain reliever dependence was represented through the use of the variable labeled "pain reliever dependence in the past year", which was coded as DEPNDANL in the NSDUH codebook. This variable included to following categories: No (coded as 0) and Yes (coded as 1).

Marijuana dependence. Marijuana dependence was represented through the use of the variable labeled "marijuana dependence in the past year", which was coded as DEPNDMRJ in the NSDUH codebook. This variable included the following categories: No (coded as 0) and Yes (coded as 1).

Mental health treatment. Mental health treatment was represented through the use of the variable labeled "mental health treatment in the past year", which was coded as MHTX_CLEAN in the NSDUH codebook. This variable included the following categories: No (coded as 0) and Yes (coded as 1).

Drug treatment. Drug treatment was represented through the use of the variable labeled "drug use treatment in the past year", which was coded as TXCO_DRUG_CLEAN in the NSDUH codebook. This variable included the following categories: No (coded as 0) and Yes (coded as 1).

Socioeconomic status. Socioeconomic status (SES) was represented through the use of the INCOME in the NSDUH codebook. This variable included the following categories: less than $20,000 (coded as 1), $20,000 - $49,999 (coded as 2), $50,000 - $74,999 (coded as 3), and $75,000 or more (coded as 4).

Gender. Gender included males (coded as 0) and females (coded as 1), and was represented by the IRSEX variable found in the NSDUH codebook.

Age. The age of participants was categorized into subgroups based on the original variable FINAL_AGE in the NSDUH codebook. Data for age were originally categorized as Respondent is 18 years old (coded as 7), Respondent is 19 years old (coded as 8), Respondent is 20 years old (coded as 9), Respondent is 21 years old (coded as 10), Respondent is 22 or 23 years old (coded as 11), Respondent is 24 or 25 years old (coded as 12), Respondent is 26 and 29 years old (coded as 13), Respondent is 30 and 34 years old (coded as 14), Respondent is 35 and 49 years old (coded as 15), Respondent is 50 and 64 years old (coded as 16), Respondent is 65 years or older (coded as 17). In order to conduct this analysis using more meaningful subgroups, a new variable was computed using the following categories: young adult (code of 1 = age 18-30), middle adult (2 = age 31-64), and older adult (3 = age 65+). Life stages were developed based on content from Zastrow & Kirst-Ashman, 2015).

Education. The variable EDUCCAT2 from the NSDUH was used to represent participant's level of education. The following categories existed: less than high school graduate (coded as 1), high school graduate (coded as 2), some college education (coded as 3), and college graduate (coded as 4).

Race/ethnicity. Race/ethnicity was measured using the variable NEWRACE2 in the NSDUH dataset. Non-Hispanic Whites (coded as 1), Non-Hispanic Blacks/African Americans (coded as 2), Native American/Alaska Natives (coded as 3), Native Hawaiian/Other Pacific Islander (coded as 4), Asians (coded as 5), Non-Hispanic people of more than one race (coded as 6), and Hispanic (coded as 7).

Data analysis

In order to address each research question, multiple chi-square tests were performed in order to see if there were significant differences in the dependent variables (i.e., dependence on nicotine, alcohol, pain relievers, and marijuana in research question 1; mental health and substance abuse treatment in research question 2) based on each individual independent variables (i.e., socioeconomic status, gender, age, education, or race/ethnicity). A chi-square test is appropriate when you are analyzing two categorical variables from a single population. Significant results indicated that there was some difference in the categories for each independent variable. Since all of the independent variables, except gender, had more than 2 categories a post hoc test was also performed in order to determine the significance of each category (Beasley & Schumacker, 1995; García-Pérez & Núñez-Antón, 2003). In order to conduct the post hoc tests, data were prepared by multiplying the adjusted zed scores of the original chi-square test by themselves to get adjusted chi-square scores. Then, another chi-square analysis was run on these individual scores to determine which categories were actually different from the others.

Results

Dependence on Nicotine

Socioeconomic status. A chi-square test of independence was calculated comparing the frequency of nicotine dependence between people with different levels of income. The categories were less than $20,000; $20,000-$49,999; $50,000-$74,999; and $75,000 or more. A significant interaction was found ($X^2(3)= 152.780$, $p < .05$). Those who make less than $20,000 per year are most likely to have nicotine dependence (22.6%) when compared to all other categories of income. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in nicotine dependence among the income category $50,000 - $74,999. However, there are significant differences in nicotine dependence among the income categories less than $20,000, $20,000 - $49,999, $75,000 or more.

Table 2. *Chi square table of income and nicotine dependence in past month*

Variable	< $20,000	$20,000-$49,999	$50,000-$74,999	$75,000+	*t*	*df*
Dependent	2022	2002	754	844	152.78	3
Not	994	1044	454	844	152.78	3

*Note: $p < .05$ indicates significance

Gender. A chi-square test of independence was calculated comparing nicotine dependence between men and women. A significant interaction was found ($X^2(1)= 42.732$, $p < .05$). Men are slightly more likely to have nicotine dependence (32.1%) than women (30.7%).

Table 3. *Chi square table of gender and nicotine dependence in past month*

Variable	Male	Female	*t*	*df*
Dependent	2874	2748	42.73	1
Not	1943	1393	42.73	1

*Note: $p < .05$ indicates significance

Age. A chi-square test of independence was calculated comparing the frequency of nicotine dependence between people in young adulthood, middle adulthood, and late adulthood. A significant interaction was found ($X^2(2)=391.662$, $p < .05$). Young adults are more likely to have nicotine dependence (33.6%) than those in middle (27.3%) or late adulthood (1.8%). The post hoc analysis confirms that there are significant differences in nicotine dependence among these three groups.

Table 4. *Chi square table of age and nicotine dependence in past month*

Variable	18-30	31-64	65+	*t*	*df*
Dependent	3014	2444	164	391.66	2
Not	2490	801	45	391.66	2

*Note: $p < .05$ indicates significance

Education. A chi-square test of independence was calculated comparing the frequency of nicotine dependence between people with different levels of education. The categories were less than high school graduate, high school graduate, some college education, and college graduate. A significant interaction was found ($X^2(3)=797.406$, $p < .05$). High school graduates are more likely to have nicotine dependence (25.3%) when compared to all other categories of education. The post hoc analysis confirms that there are significant differences in nicotine dependence by education.

Table 5. *Chi square table of education and nicotine dependence in past month*

Variable	1	2	3	4	*t*	*df*
Dependent	1490	2270	1440	422	797.41	3
Not	422	897	1215	802	797.41	3

*Note: 1= Less than high school, 2= High school, 3= Some college, 4= College graduate
$p < .05$ indicates significance

Race/ethnicity. A chi-square test of independence was calculated comparing the frequency of nicotine dependence between Whites, Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, people of more than one race, and Hispanic persons. A significant interaction was found ($X^2(6)= 304.950$, $p < .05$). Non-Hispanic Whites are more likely to have nicotine dependence (45.2%) than all other racial categories. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in nicotine dependence among Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, or people of more than one race. However, there are significant differences in nicotine dependence among the racial categories Whites, Asians, and Hispanics.

Table 6. *Chi square table of race and nicotine dependence in past month*

Variable	1	2	3	4	5	6	7	*t*	*df*
Dependent	4047	679	117	28	78	234	439	304.95	2
Not	1985	370	89	21	116	132	623	304.95	2

*Note: 1=Whites, 2=Blacks, 3= Native American/Alaskan Natives, 4= Native Hawaiians/Other Pacific Islander, 5= Asians, 6= people of more than one race, 7= Hispanics, p < .05 indicates significance

Dependence on Alcohol

Socioeconomic status. A chi-square test of independence was calculated comparing the frequency of alcohol dependence between people with different levels of income. The categories were less than $20,000; $20,000-$49,999; $50,000-$74,999; and $75,000 or more. A significant interaction was found ($X^2(3)= 12.069$, $p < .05$). Those who make less than $20,000 per year are most likely to be dependent on alcohol (6.4%) when compared to all other categories of income. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in

alcohol dependence among the income categories less than $20,000; $20,000-$49,999; and $50,000-$74,999. These results suggest that there are slight differences in alcohol dependence among the income category $75,000 or more, but overall, these differences are not significant.

Table 7. *Chi square table of income and alcohol dependence in past year*

Variable	< $20,000	$20,000-$49,999	$50,000-$74,999	$75,000+	*t*	*df*
Dependent	570	537	235	367	12.07	3
Not	2446	2509	973	1321	12.07	3

*Note: $p < .05$ indicates significance

Gender. A chi-square test of independence was calculated comparing the frequency of alcohol dependence between men and women. No significant relationship was found ($X^2(1)= 2.798$, $p > .05$). Gender is not a significant factor in determining alcohol dependence.

Table 8. *Chi square table of gender and alcohol dependence in past year*

Variable	Male	Female	*t*	*df*
Dependent	950	759	2.79	3
Not	3867	3382	2.79	3

*Note: $p < .05$ indicates significance

Age. A chi-square test of independence was calculated comparing the frequency of alcohol dependence between people in young adulthood, middle adulthood, and late adulthood. A significant interaction was found ($X^2(2)= 37.920$, $p < .05$). Young adults are more likely to be dependence on alcohol (12.9%) than those in middle (6.0%) or late adulthood (0.2%). The post hoc analysis confirms that there are significant differences in alcohol dependence among these three groups.

Table 9. *Chi square table of age and alcohol dependence in past year*

Variable	18-30	31-64	65+	*t*	*df*
Dependent	1152	537	20	37.92	2
Not	4352	2708	189	37.92	2

*Note: $p < .05$ indicates significance

Education. A chi-square test of independence was calculated comparing the frequency of alcohol dependence between people with different levels of education. The categories were less than high school graduate, high school graduate, some college education, and college graduate. A significant interaction was found ($X^2(3)= 107.014$, $p < .05$). People with some college education are most likely to have an alcohol dependence (6.4%) when compared to all other categories of education. The post hoc analysis confirms that there are significant differences in alcohol dependence by education.

Table 10. *Chi square table of education and alcohol dependence in past year*

Variable	1	2	3	4	*t*	*df*
Dependent	291	505	576	337	107.01	3
Not	1621	2662	2079	887	107.01	3

*Note: 1= Less than high school, 2= High school, 3= Some college, 4= College graduate
$p < .05$ indicates significance

Race/ethnicity. A chi-square test of independence was calculated comparing the frequency of alcohol dependence between Whites, Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, people of more than one race, and Hispanic persons. A significant interaction was found ($X^2(6)= 47.554$, $p < .05$). Whites are more likely to be dependent on alcohol (11.9%) than all other racial categories. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in alcohol dependence among the racial categories Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, and people of more than one race. Taken

together, these results suggest that there are slight differences in alcohol dependence among Whites and Hispanics but these differences are not significant.

Table 11. *Chi square table of race and alcohol dependence in past year*

Variable	1	2	3	4	5	6	7	*t*	*df*
Dependent	1063	188	54	11	54	79	439	47.55	6
Not	4969	861	152	38	140	287	802	47.55	6

*Note: 1=Whites, 2=Blacks, 3= Native American/Alaskan Natives, 4= Native Hawaiians/Other Pacific Islander, 5= Asians, 6= people of more than one race, 7= Hispanics, $p < .05$ indicates significance

Dependence on Pain Relievers

Socioeconomic status. A chi-square test of independence was calculated comparing the frequency of pain reliever dependence between people with different levels of income. The categories were less than $20,000; $20,000-$49,999; $50,000-$74,999; and $75,000 or more. No significant relationship was found ($X^2(3)= 5.962$, $p > .05$). There are no differences in pain reliever dependence based upon one's socioeconomic status.

Table 12. *Chi square table of income and pain reliever dependence in past year*

Variable	< $20,000	$20,000-$49,999	$50,000-$74,999	$75,000+	*t*	*df*
Dependent	129	95	48	61	5.96	3
Not	2887	2951	1160	1627	5.96	3

*Note: $p < .05$ indicates significance

Gender. A chi-square test of independence was calculated comparing the frequency of pain reliever dependence between men and women. No significant relationship was found ($X^2(1)= .014$, $p > .05$). Gender is not a significant factor in determining pain reliever dependence.

Table 13. *Chi square table of gender and pain reliever dependence in past year*

Variable	Male	Female	*t*	*df*
Dependent	178	155	.014	1
Not	4639	3986	.014	1

*Note: $p < .05$ indicates significance

Age. A chi-square test of independence was calculated comparing the frequency of pain reliever dependence between people in young adulthood, middle adulthood, and late adulthood. A significant interaction was found ($X^2(2)= 22.254$, $p < .05$). Young adults are more likely to have a pain reliever dependence (2.7%) than those in middle (0.9%) or late adulthood (0%). Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in pain reliever dependence among those in later adulthood. Taken together, these results suggest that there are significant differences in pain reliever dependence among the age categories young adulthood and middle adulthood.

Table 14. *Chi square table of age and pain reliever dependence in past year*

Variable	18-30	31-64	65+	*t*	*df*
Dependent	245	85	3	22.25	2
Not	5259	3160	206	22.25	2

*Note: $p < .05$ indicates significance

Education. A chi-square test of independence was calculated comparing the frequency of pain reliever dependence between people with different levels of education. The categories were less than high school graduate, high school graduate, some college education, and college graduate. A significant interaction was found ($X^2(3)= 8.641$, $p < .05$). High school graduates are most likely to have a pain reliever dependence (1.4%) when compared to all other categories of education. Although the overall chi-square test

was significant, the post hoc analysis reveals that there are no significant differences in pain reliever dependence among all education categories.

Table 15. *Chi square table of education and pain reliever dependence in past year*

Variable	1	2	3	4	*t*	*df*
Dependent	86	123	93	31	8.64	3
Not	1826	3044	2562	1193	8.64	3

*Note: 1= Less than high school, 2= High school, 3= Some college, 4= College graduate
$p < .05$ indicates significance

Race/ethnicity. A chi-square test of independence was calculated comparing the frequency of pain reliever dependence between Whites, Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, people of more than one race, and Hispanic persons. A significant interaction was found ($X^2(6)= 22.872$, $p < .05$). Whites are more likely to have a dependence on pain relievers (2.8%) than all other racial categories. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in pain reliever dependence among the racial categories Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, people of more than one race, and Hispanic persons.

Table 16. *Chi square table of race and pain reliever dependence in past year*

Variable	1	2	3	4	5	6	7	*t*	*df*
Dependent	255	19	3	1	2	16	37	22.87	6
Not	5777	1030	203	48	192	350	1025	22.87	6

*Note: 1=Whites, 2=Blacks, 3= Native American/Alaskan Natives, 4= Native Hawaiians/Other Pacific Islander, 5= Asians, 6= people of more than one race, 7= Hispanics, $p < .05$ indicates significance

Dependence on Marijuana

Socioeconomic status. A chi-square test of independence was calculated comparing the frequency of marijuana dependence between people with different levels

of income. The categories were less than $20,000; $20,000-$49,999; $50,000-$74,999; and $75,000 or more. A significant interaction was found ($X^2(3)= 24.590$, $p < .05$). Those who make less than $20,000 per year are more likely to be dependent on marijuana (3.6%) when compared to all other categories of income. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in marijuana dependence among the income categories $20,000-$49,999; $50,000-$74,999; and $75,000 or more..

Table 17. *Chi square table of income and marijuana dependence in past year*

Variable	< $20,000	$20,000-$49,999	$50,000-$74,999	$75,000+	*t*	*df*
Dependent	320	228	85	137	24.59	3
Not	2696	2818	1123	1551	24.59	3

*Note: $p < .05$ indicates significance

Gender. A chi-square test of independence was calculated comparing the frequency of marijuana dependence between men and women. A significant interaction was found ($X^2(1)= 28.770$, $p < .05$). Men are more likely to have a marijuana dependence (5.4%) than women (3.2%).

Table 18. *Chi square table of gender and marijuana dependence in past year*

Variable	Male	Female	*t*	*df*
Dependent	485	285	28.77	1
Not	4332	3856	28.77	1

*Note: $p < .05$ indicates significance

Age. A chi-square test of independence was calculated comparing the frequency of marijuana dependence between people in young adulthood, middle adulthood, and late adulthood. A significant interaction was found ($X^2(2)= 194.703$, $p < .05$). Young adults are more likely to have a marijuana dependence (7.3%) than those in middle (1.3%) or late adulthood (0.0%). The post hoc analysis confirms that there are significant differences in marijuana dependence among these three groups.

Table 19. *Chi square table of age and marijuana dependence in past year*

Variable	18-30	31-64	65+	*t*	*df*
Dependent	653	113	4	194.70	2
Not	4851	3132	205	194.70	2

*Note: $p < .05$ indicates significance

Education. A chi-square test of independence was calculated comparing the frequency of marijuana dependence between people with different levels of education. The categories were less than high school graduate, high school graduate, some college education, and college graduate. A significant interaction was found ($X^2(3)= 20.901$, $p < .05$). High school graduates are most likely to have a marijuana dependence (3.0%) when compared to all other categories of education. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in marijuana dependence among the education categories less than high school graduate, high school graduate, some college education.

Table 20. *Chi square table of education and marijuana dependence in past year*

Variable	1	2	3	4	*t*	*df*
Dependent	117	267	259	67	20.90	3
Not	1735	2900	2396	1157	20.90	3

*Note: 1= Less than high school, 2= High school, 3= Some college, 4= College graduate
$p < .05$ indicates significance

Race/ethnicity. A chi-square test of independence was calculated comparing the frequency of marijuana dependence between Whites, Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, people of more than one race, and Hispanic persons. A significant interaction was found ($X^2(6)= 102.045$, $p < .05$). Non-Hispanic Whites are more likely to have a marijuana dependence (4.5%) than all other racial categories. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in marijuana dependence among the racial categories Native American/Alaskan Natives,

Native Hawaiians/Other Pacific Islander, Asians. Taken together, these results suggest that there are significant differences in marijuana dependence among the racial categories Whites, Blacks/African Americans, people of more than one race, and Hispanic persons.

Table 21. *Chi square table of race and marijuana dependence in past year*

Variable	1	2	3	4	5	6	7	*t*	*df*
Dependent	399	147	25	7	15	50	127	102.05	6
Not	5633	902	181	42	179	316	935	102.05	6

*Note: 1=Whites, 2=Blacks, 3= Native American/Alaskan Natives, 4= Native Hawaiians/Other Pacific Islander, 5= Asians, 6= people of more than one race, 7= Hispanics, $p < .05$ indicates significance

Mental Health Treatment

Socioeconomic status. A chi-square test of independence was calculated comparing the frequency of mental health treatment between people with different levels of income. The categories were less than $20,000; $20,000-$49,999; $50,000-$74,999; and $75,000 or more. A significant interaction was found ($X^2(3)= 38.525$, $p < .05$). Those who make less than $20,000 per year are most likely to receive mental health treatment (8.4%) when compared to all other categories of income. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in mental health treatment among the income categories less than $20,000 and $20,000-$49,999. Taken together, these results suggest that there are slight differences in mental health treatment among the income categories $50,000-$74,999, and $75,000 or more but these differences are not significant.

Table 22. *Chi square table of income and mental health treatment*

Variable	< $20,000	$20,000-$49,999	$50,000-$74,999	$75,000+	*t*	*df*
Dependent	746	576	223	372	38.53	3
Not	2243	2449	979	1309	38.53	3

*Note: $p < .05$ indicates significance

Gender. A chi-squared test of independence was calculated comparing the frequency of mental health treatment between men and women. A significant interaction was found ($X^2(1)= 236.338$, $p < .05$). Women are more likely to receive mental health treatment (13.3%) than men (8.2%).

Table 23. *Chi square table of gender and mental health treatment*

Variable	Male	Female	*t*	*df*
Dependent	732	1185	236.34	1
Not	4045	2935	236.34	1

*Note: $p < .05$ indicates significance

Age. A chi-square test of independence was calculated comparing the frequency of mental health treatment between people in young adulthood, middle adulthood, and late adulthood. A significant interaction was found ($X^2(2)= 61.683$, $p < .05$). Young adults are more likely to receive mental health treatment (11.7%) than those in middle (9.5%) or late adulthood (0.4%). Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in mental health treatment among the age category later adulthood. These results suggest that there are slight differences in mental health treatment among the age categories of young adulthood and middle adulthood.

Table 24. *Chi square table of age and mental health treatment*

Variable	18-30	31-64	65+	*t*	*df*
Dependent	1039	842	36	61.68	2
Not	4420	2388	172	61.68	2

*Note: $p < .05$ indicates significance

Education. A chi-square test of independence was calculated comparing the frequency of mental health treatment between people with different levels of education. The categories were less than high school graduate, high school graduate, some college education, and college graduate. A significant interaction was found ($X^2(3)= 54.549$, $p <$

.05). People with some college education are most likely to receive mental health treatment (6.9%) when compared to all other categories of education. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in mental health treatment among the education categories less than high school graduate and some college education. Taken together, these results suggest that there are slight differences in mental health treatment among the education categories high school graduate and college graduate, but that these differences are not significant.

Table 25. *Chi square table of education and mental health treatment*

Variable	1	2	3	4	*t*	*df*
Dependent	368	590	259	342	54.55	3
Not	1521	2553	2029	877	54.55	3

*Note: 1= Less than high school, 2= High school, 3= Some college, 4= College graduate
$p < .05$ indicates significance

Race/ethnicity. A chi-square test of independence was calculated comparing the frequency of mental health treatment between Whites, Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, people of more than one race, and Hispanic persons. A significant interaction was found ($X^2(6)= 71.839$, $p < .05$). Whites are more likely to receive mental health treatment (15.9%) than all other racial categories. Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in mental health treatment among the racial categories Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, and people of more than one race. Taken together, these results suggest that there are slight differences in mental health treatment among the racial categories Whites, Blacks/African Americans, and Hispanics but these differences are not significant.

Table 26. *Chi square table of race and mental health treatment*

Variable	1	2	3	4	5	6	7	*t*	*df*
Dependent	1413	155	37	4	27	98	183	71.84	6
Not	4582	885	167	44	166	265	871	71.84	6

*Note: 1=Whites, 2=Blacks, 3= Native American/Alaskan Natives, 4= Native Hawaiians/Other Pacific Islander, 5= Asians, 6= people of more than one race, 7= Hispanics, $p < .05$ indicates significance

Drug Treatment

Socioeconomic status. A chi-square test of independence was calculated comparing the frequency of substance abuse treatment between people with different levels of income. The categories were less than $20,000; $20,000-$49,999; $50,000-$74,999; and $75,000 or more. No significant relationship was found ($X^2(3)= 4.027$, $p > .05$). There were no differences in who attends substance abuse treatment based upon socioeconomic status.

Table 27. *Chi square table of income and substance abuse treatment*

Variable	< $20,000	$20,000-$49,999	$50,000-$74,999	$75,000+	*t*	*df*
Dependent	92	83	37	45	4.03	3
Not	135	95	34	47	4.03	3

*Note: $p < .05$ indicates significance

Gender. A chi-square test of independence was calculated comparing the frequency of substance abuse treatment between men and women. No significant relationship was found ($X^2(1)=1.554$, $p > .05$). Gender is not a significant factor in determining who receives substance abuse treatment.

Table 28. *Chi square table of gender and substance abuse treatment*

Variable	Male	Female	*t*	*df*
Dependent	137	120	1.55	1
Not	182	129	1.55	1

*Note: $p < .05$ indicates significance

Age. A chi-square test of independence was calculated comparing the frequency of substance abuse treatment between people in young adulthood, middle adulthood, and

late adulthood. A significant interaction was found ($X^2(2)= 16.365$, $p < .05$). Young adults are more likely to receive substance abuse treatment (25.9%) than those in middle (19.2%) or late adulthood (0.2%). Although the overall chi-square test was significant, the post hoc analysis reveals that there are no significant differences in substance abuse treatment among the age category later adulthood. Taken together, these results suggest that there are slight differences in substance abuse treatment among the age categories young adulthood and middle adulthood.

Table 29. *Chi square table of age and substance abuse treatment*

Variable	18-30	31-64	65+	*t*	*df*
Dependent	147	109	1	16.37	2
Not	227	84	0	16.37	2

*Note: $p < .05$ indicates significance

Education. A chi-square test of independence was calculated comparing the frequency of substance abuse treatment between people with different levels of education. The categories were less than high school graduate, high school graduate, some college education, and college graduate. No significant relationship was found ($X^2(3)= 5.932$, $p > .05$). There are no significant differences in who attends substance abuse treatment based upon level of education.

Table 30. *Chi square table of education and substance abuse treatment*

Variable	1	2	3	4	*t*	*df*
Dependent	57	93	76	31	5.93	3
Not	96	102	85	28	5.93	3

*Note: 1= Less than high school, 2= High school, 3= Some college, 4= College graduate
$p < .05$ indicates significance

Race/ethnicity. A chi-square test of independence was calculated comparing the frequency of substance abuse treatment between Whites, Blacks/African Americans, Native American/Alaskan Natives, Native Hawaiians/Other Pacific Islander, Asians, people of more than one race, and Hispanic persons. A significant interaction was found

($X^2(6)= 12.927$, $p < .05$). Non-Hispanic Whites are more likely to receive substance abuse treatment (34.2%) than all other racial categories. However, the post hoc analysis shows that there are not significant differences in substance abuse treatment by race.

Table 31. *Chi square table of race and substance abuse treatment*

Variable	1	2	3	4	5	6	7	*t*	*df*
Dependent	194	16	6	2	1	8	30	12.93	6
Not	202	34	9	0	6	15	45	12.93	6

*Note: 1=Whites, 2=Blacks, 3= Native American/Alaskan Natives, 4= Native Hawaiians/Other Pacific Islander, 5= Asians, 6= people of more than one race, 7= Hispanics, $p < .05$ indicates significance

Discussion

Highlight of Significant Results

When examining nicotine dependence, White young adult males who have graduated high school and make less than $20,000 a year appear to be at significant risk compared to other groups. The significant demographic variables that are related to alcohol dependence were White young adults who have some college education. When examining pain reliever dependence, White young adults were most at risk. In regard to marijuana dependence, White young adult males who make less than $20,000 a year were significantly more likely to be dependent than other groups. White young adult females were significantly more likely to receive mental health treatment. Finally, young adults, when compared to other groups, were most likely to receive substance abuse treatment.

Comparison of Results to Previous Literature

Dependence on nicotine. The findings of this research were consistent with previous studies in different ways. For example, White young adult males who have graduated high school and make less than $20,000 a year were more likely to have a dependence on nicotine. Past research has found that smoking nicotine-based products is still viewed as a masculine behavior and is favored by young adults because their body has not yet begun to physically decline in any way (Woo, & Juhee, 2012). This study identified that nicotine had other common predictors, people who made less than $20,000 a year and high school graduates. These results are consistent with previous research that shows that those with a lower level of education smoke more than those with a higher level of education (Centers for Disease Control, 2017). These findings might explain that

smoking can be associated with what kind of job a person might have (Centers for Disease Control, 2017). The only variable that has not been consistent with past research is that of gender. The results of this research study showed being male was related to dependence on both nicotine and marijuana. However, recent research has shown that women have started to show higher proportions of smoking than men (Flandorfer, Wegner, & Buber, 2010).

Dependence on alcohol. The variables that predict alcohol dependence are White young adults who have some college education. The results were consistent with past research that has identified young adults and those at lower income levels as more likely to develop a dependence on alcohol (Cerdáa, Johnson-Lawrence, & Galeaa, 2011; National Health Interview Survey, 2015). In relation to the finding that some college education is related to alcohol dependence, perhaps college students that become involved in partying too frequently develop a dependence on alcohol, which then inhibits their success as a student and potentially leads to dropping out. This is likely due to exposure to alcohol in college settings. This finding could also be supported by the fact that traditional college students turn 21 while in college, allowing them to drink alcohol legally. However, these students are still developing cognitively and may have difficulty regulating their substance use (SAMHSA, 2013). Researchers have found that those with higher levels of education have lower reported alcohol abuse and dependence (Caldwell et al., 2008).

Dependence on pain relievers. The only two variables that predicted pain reliever dependence were age and race. However, a likely explanation for young adults being dependent on pain relievers more than any other age group is likely due to younger

generations being more dependent on medication for their daily lives (NIDA, 2016a). The results of this research study do support some previous research findings but not all. Past research has shown that Whites are more likely to use pain relievers than any other race (McCabe et al., 2005). Other research has shown that Blacks use pain relievers more than Whites (Salas, Scherrer, Lustman, & Schneider, 2015). However, researchers have also shown that there is no significant difference in pain reliever use among any race (McDonald, Carlson, & Izrael, 2012). Previous research has also pointed out that there have been relatively few studies examining racial and ethnic differences in the use of substances other than alcohol (Delva, Smith, Howell, Harrison, Wilke, & Jackson, 2004; Meilman, Presley, & Cashin, 1995; Mohler-Kuo, Lee, & Wechsler, 2003). Lastly, adults age 40 and older are more likely to use prescription opioids than adults aged 20-39 (Frenk, Porter, & Paulozzi, 2015; Paulozzi, Strickler, Kreiner, & Koris, 2015), which is likely because this group has greater access or need of prescription drugs. These findings are contrary to the results of this study.

Dependence on marijuana. According to this study, marijuana dependence is significantly more prevalent among White young adult males who make less than $20,000 a year. This is consistent with past research that has identified males as having higher rates of marijuana use (SAMHSA, 2014). The results of this research study are also consistent with studies that have identified young adults use marijuana more than any other age group (NIDA, 2016b). However, other past research has shown that income isn't a very consistent predictor of marijuana dependence (Popovici & French, 2014). Contrary to the results found in this study, researchers have found that Blacks are more likely to have marijuana dependence than Whites (Pacek, Malcolm, & Martins, 2012).

Mental health and substance abuse treatment. White young adult females are more likely to receive mental health treatment. These results are supported by past research that has found that females are more likely to report mental health problems than males are (National Centre for Social Research, 2004; Northern Ireland Statistics and Research Agency, 2002). Findings like this are likely due to gender stereotypes that men seem weak or vulnerable if they report having some form of mental health issue (World Health Organization, 2008). When considering age, it is possible that older adults are more likely to have jobs and families, which would deter them from seeking out any kind of treatment.

According this study, being a young adult is the most significant demographic variable in regard to who attends substance abuse treatment. Previous research says that women are just as likely as men to stay and engaged in treatment (SAMHSA, 2009); however, this study did not find gender to be significant when comparing gender. In support of this research study research, White young adults have been more likely to attend substance abuse treatment (NIDA, 2011b). As for the age distinction, this could be due to the stigma towards those who receive substance abuse treatment. Although the stigma has lessened over time, younger adults may feel less stigma than older adults and be more likely to attend treatment (Arndt, Clayton, & Schultz, 2011).

Limitations

The primary limitation is the nature of secondary data analysis. The researcher was restricted to the variables and types of measurement that were originally used in original data collection effort. Another limitation to this study was the original

categorization of age, which was not separated into equal or standardized categories. In order to conduct a meaningful analysis, new categories had to be created.

A possible limitation of this project would be the possibility of response bias when surveyed. Participants may have given answers that they think society would want them to give or they may have under-reported problems. In addition, many of the questions asked on the surveys were yes and no questions, which do not capture as many dimensions of substance use disorders, such as level of severity.

Recommendations.

Research implications. Smoking marijuana and nicotine share a common variable, young adult males who make less than $20,000 a year. Future research should investigate smoking habits of this demographic to see if the results are consistent. In addition, researchers should examine smoking prevalence among females and male, as well Whites and Blacks due to conflicting results when compared to past research. Lastly, income as a predictor for marijuana dependence should be explored as a subject of future research. Across multiple results identified in this study, the lowest income is a significant predictor of drug dependence. Future research should examine whether this is consistent across all populations and identify ways to combat this trend.

Practice implications. When considering a trend that can be addressed by social work practitioners, one demographic that appears in every variable in this study are young adults. This should be considered when developing any new forms of treatment, as well as prevention. Colleges and other institutions that interact with young adults may need to make more of an effort to reach out to this population and try to prevent drug use

and dependence. Although young adults do show higher levels of drug dependence, it is possible that other age groups are underserved or not be identified. Social work practitioners and medical providers may need to ensure that they are appropriately screening for drug dependence among middle and older adults. Another consideration is that current mental health or substance abuse treatment programs may not be culturally appropriate for all groups. Social workers should consider home-visiting programs for older adults who may not be able to drive to an appointment or family-inclusive treatments for those that are middle aged and have families. Clinicians should work to identify and make substance abuse programs and environments friendly to all groups.

Policy implications. It is notable that past research has found a growing trend in pain reliever abuse and dependence. The results of this research study concur with past research. It is recommended that policies concerning pain reliever distribution be improved or developed in response to the number of people misusing pain relievers. The creation of a national prescription regulation policy may improve the problem, such as the implementation of a nationally available prescription drug database available to all doctors and pharmacists. In addition, policymakers should consider implementing less punitive drug laws that would decriminalize drug use, those who are low income or people of color often face a disadvantage. Finally, more culturally competent treatment programs are needed, as many treatment programs have been developed around the needs of White male Americans.

Conclusion

Although trends often change, there is a consistent tendency for those who are most vulnerable due to age, racial group, or income level to be more susceptible to drug dependence than those with more support or resources. This research supports the need for more culturally competent and responsive practices and policies for those experiencing drug dependence. However, there is also a need for more understanding from future research.

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